ENVIRONMENTAL MANAGEMENT ACCOUNTING IMPLEMENTATION IN ENVIRONMENTALLY SENSITIVE INDUSTRIES IN MALAYSIA

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Abstract

This research investigates the level of EMA implementation in companies within environmentally sensitive industries in Malaysia, as well as gaining insights into pressures for implementation. It was found that there are elements of environmental-related management accounting within some of the organizations in which interviews were conducted. Implementation was driven by a motivation to reduce costs rather than environmental conservation. Apart from that, companies' reactions to environmental issues stem from pressures from customers who demand environmentally sensitive workplaces, procedures and processes in the companies with which they are in business.

1. INTRODUCTION

Environmental accounting emerged in the 1970s as a result of an increase in environmental awareness and concerns about social and environmental wellbeing (Hecht, 2000). It has three distinct foci: national income accounting, examining macroeconomic measures in a national economic context; financial accounting, including companies' estimation and reporting of environmental concerns to the public; and management accounting, where the context is the use of environmental data in companies' decisions and operations (Bennett & James, 2000).The financial accounting part of environmental accounting is readily available through annual reports, sustainability reports and other reporting media (KPMG, 2011). Research on these environmental disclosures is also well documented.

In contrast, management accounting information related to operations is usually considered to be internal and confidential. This operational part of environmental accounting needs further

research. Cullen and Whelan (2006) claim that environmental disclosures alone will not carry weight without attempts to integrate them with management accounting. For example, companies could implement proactive actions that could prevent or at least reduce the possibility of environmental degradation through their operations. One strategic management accounting tool to measure and monitor these operational actions is environmental management accounting (EMA). This research attempts to discover whether EMA has been implemented and whether the environment is considered in decision making within environmentally-sensitive industries. It also uncovers the perceptions of key personnel directly involved in companies' operations on environmental consideration and conservation within their companies.

2. LITERATURE

EMA's objectives are to optimize corporate environmental and economic performance using financial and non-financial information (Bennett & James, 2000). Since its conception, EMA's implementation has been consistent, although slow to spread (Rikhardsson et al., 2005). A survey conducted by the Chartered Institute of Management Accountants (CIMA) in 2009 found that EMA was the second least used strategic management accounting tool and that it is only being used by large companies that have to conform to strict regulations such as carbon footprint and emissions trading schemes. Similarly, even though companies are regulated to present environmental impact assessment (EIA) reports and obtain approval from related authorities prior to the commencement of projects, these reports cover only how companies plan to handle potential environmental issues when conducting these projects rather than monitoring and controlling actual management of, for example, fuel, water and waste.

The rest of this literature section will look at EMA definitions, the importance of EMA for decision making and previous research on implementation of EMA.

a. Definitions

There are a number of definitions of EMA. For instance, Savage, Ligon, and Lomsek (2001, p. 8) state that EMA is:

> *the identification, collection, estimation, analysis, internal reporting, and use of physical flow information (i.e., materials, water, and energy flows), environmental cost information, and other monetary information for both conventional and environmental decision-making within an organization.*

Burritt, Hahn, and Schaltegger (2002) divide these costs and physical flows into what they call Monetary EMA (MEMA) and Physical EMA (PEMA). MEMA, as part of environmentally differentiated conventional accounting, incorporates monetary impacts of the corporation on the natural environment. PEMA focuses on the physical impacts of the corporation, expressed in terms of physical units, such as kilograms.

Some definitions include externalities as a cost component. Externalities are costs that are 'external to the company', which are basically the environmental and social effects caused to the public (Jasch, 2003). Both Schaltegger and Burritt (2000) and UN DSD (2001) disqualify externalities as part of EMA cost saying they are only an effect of bad decisions. For example, as water pollution is an effect of toxic waste dumping in rivers, companies should not include cleaning up of the pollution as an EMA cost. IFAC claims that externalities that affect the environment and society should be placed under governments' control through the use of political instruments such as eco-taxes, which should be integrated into corporate cost calculations and not be internalized as part of EMA costs (UN DSD, 2001).

Graff et al. (1998) believe in recognising materials and environmental costs in business decision-making. They believe that linking financial goals with environmental goals will provide an end result of financial and environmental improvement, thus avoiding

over/underestimation of profitability. The important factor in this view is defining what is considered as environmental cost. Instead of bundling every environmental cost under environmental overhead, companies need to be able to accurately allocate these costs into specific cost categories and thus make better business decisions. Bennett and James (2000) are more concerned about how environmental information is used in business decision-making. They argue that even though environment-related management accounting relies heavily on non-financial information, the information is useful to support managers in ensuring sustainable business.

One can conclude that, as managers of companies have the capacity to act and judge in an intelligent and responsible manner, making decisions efficiently and prudently based on relevant and current data, they should be responsible and accountable for the effects of those decisions. One way to do this would be to include externalities in decision making and not just disclose environmental and social endeavours to legitimise their business operation to the world.

b. The importance of EMA in decision making

EMA is being implemented in various forms which are diffused with conventional management accounting practices (Rikhardsson et al., 2005). Concerns over whether EMA implementation will actually increase profitability and concerns about the need to make large investments in infrastructure prior to commencing EMA may impede its implementation (Nik Muhammad et al., 2004; Wagner et al., 2002). However, research has shown that companies that have implemented environmental accounting have been able to garner positive outcomes on their environmental and economic performance (Klassen and McLaughlin, 1996; Leal et al., 2003; Sulaiman and Nik Ahmad, 2006; EPA Australia, 2003).

Despite the growing environmental awareness and 'green' attitudes within the corporate sector, research findings show that the level of implementation of environmental-friendly practices is low (Gadenne, Kennedy, & McKeiver, 2009). The case study research of Masanet-Llodra (2006) shows that incongruities may exist between a company's environmental strategy and its environmental behaviour reflected in actions. In other words, a company may appear to be highly environmentally committed while in fact this commitment has not been translated into action.

In a survey on environmental awareness and practices of small and medium enterprises (SMEs), Gadenne et al. (2009) examine the relationship between influences from various stakeholders and the awareness of environmental issues. The findings show that legislation does result in general environmental awareness and, due to that, companies are willing to change their business processes and environmental strategies. Nonetheless, a major obstacle for owner/managers of SMEs is the lack of financial resources to implement environmental management systems in their companies. Hence, to develop environmental awareness and translate it into action, companies may need external help and even a push from other stakeholders. Furthermore, EMA has to be tailored to the special needs of the company rather than be applied as a generic system (Sendroiu et al., 2006). Rikhardsson et al. (2005) claim that whether using EMA is an efficient choice for decision making, a result of pressures from other forces or an act of innovation, the impact of EMA is strengthened when companies use EMA as a tool to aid decision making, incorporating it within all levels of operation, not just using it for a short period of time or because others are doing it.

Nonetheless, findings of research on EMA implementation are not encouraging as it was considered the second least popular of the 18 strategic management accounting tools (Ross & Kovachev, 2009). Ross and Kovachev (2009) claim that the need for compliance with

regulations (e.g. carbon footprint, emission trading) may be the reason why more large companies are using EMA compared to small and medium sized companies. The CIMA (2009) survey raised questions of whether environmental issues are being addressed in management decision making and whether environment-related management accounting should be regulated or at least promoted by way of incentives to ensure more environmental considerations are being addressed in internal decision making.

c. EMA in use

The overall objective of EMA is to include environment-related costs (either monetary or non-monetary) into decision making at every level in the organisation. These costs could be traced to specific products or cost centres and when they are not traceable, they could be combined and reapportion to cost centres (Burritt, 2000; Ditz, Ranganathan, & Banks, 2000; Schaltegger & Muller, 2000). The identification and inclusion of environmental costs in decision making may (arguably) provide accurate calculations of costs which subsequently enable effective control and reduction of these costs (Ferreira, Moulang, & Hendro, 2010). EMA usage may also have a positive effect on both environmental and financial performance (Schaltegger & Muller, 2000).

In terms of implementation, [who said this? put in a reference] EMA is different from common strategic management accounting tools, like SWOT analysis or Boston matrices. EMA is a tailor-made tool, which alters according to the scope of operations as well as the type of expenses that have a significant impact on the environment, which are the expenses that need to be controlled and monitored. Research on EMA is also scarce (Rikhardsson, Bennett, Bouma, & Schaltegger, 2005), except for compilation of case studies in Bennett and James (2000), Schaltegger and Burritt (2000) and Rikhardsen, Bennett, Bouma and Schaltegger (2005) conducted in various locations and of various types of operations.

Ferreira et al. (2010) argue that the implementation of EMA is not driven by the size of a company but by the type of industry it relates to. They also suggest that "innovation is a potential outcome arising from EMA use" (p. 939) and that by using EMA, companies are able to "identify opportunities and be able to generate process innovation" (p. 936). They suggest that the use of EMA may lead to "identification of opportunities to improve production processes" (p.938).

Epstein and Roy (2000) illustrate how environmental considerations can be embedded into a company's capital investment making process. They posit that rather than implementing environmental control in small projects, companies should invest in technological investments in order to maintain environmental conservation and improve environmental performance. Epstein and Roy (2000) suggest that externalities can also be determined and included as internal costs through introducing technological costs to conserve the environment as substitutes for approximation of costs for damage control (externalities) and internalised by the company when making decisions.

d. Government initiatives in promoting EMA

As governments around the globe are placing greater emphasis on environmental issues, Gadenne et al. (2009) claim that many initiatives have been formulated to increase the level of environmental awareness. The United Nations, through its Division for Sustainable Development, has promoted EMA to governments and businesses interested in applying and understanding its benefits (UN DSD, 2001). Developed countries seem to be a step ahead in promoting EMA. In Europe, for instance, the Pollution Prevention Pays programme was designed to disseminate the EMA concept, while in the United States, the high level of potential liabilities pushed companies to be more concerned about their environmental costs (Sendroiu et al., 2006).

Countries around the world have also introduced legislation, increased the amount of fines for violators, set policies and imposed taxes to safeguard the environment (Goh, Zailani, & Nabsiah Abd, 2006). Nonetheless, these undertakings are basically 'end-of-pipe' methods of punishing the perpetrators of environmental degradation instead of preventing it from happening. Governments, both central and local, could provide more incentives and initiatives to encourage environmental conservation and companies could make innovations to ensure their operations do not jeopardise the environment by introducing cleaner production (Scarvone, 2005).

Mia (2005) provides a description of a government's role in promoting EMA by providing a comprehensive view of a developing country's efforts to encourage EMA utilization. As well as governments' developing policies to guide and encourage companies to implement EMA in decision making, Mia believes that concerted efforts of government, industry players, academics and society are key to successful EMA implementation.

e. Environmental reporting and EMA

Previous environmental reporting literature provides evidence of an increasing trend for companies to report environmental information (Llena et al., 2007; KPMG, 2005; Bennett et. al., 2002). This development stems from the escalating public awareness and concerns about responsible business decision making, government initiatives to encourage environmentally sustainable businesses as well as companies' initiatives to voluntarily disclose their environmental considerations and activities to stakeholders and the general public. Various reporting initiatives by companies as well as research conducted on environmental reporting have developed steadily over the last decade (Llena *et al.*, 2007; Mathews, 1997) and covered various aspects of reporting environmental issues, quality of reports (Adams, 2004) and longitudinal studies of environmental reporting (Gray et al., 1995).

Concerns that the environmental information presented in external reports is initiated as a result of prosecution for environmental transgression have also being voiced (Deegan et al., 2002). For example, Herzig and Schaltegger (2006) claim that reporting of environmental considerations surfaced in the 1980s and early 1990s after the Chernobyl and Bhopal accidents. The source of environmental problems was perceived to be internal and the only way for companies to eliminate the negative perceptions was by disclosing their environmental activities to the public and stakeholders via environmental reporting (Herzig and Schaltegger, 2006).

To date, there have been substantial developments in environmental reporting agendas, especially in European countries, such as Germany, Norway and the UK, that have regulated the presentation of environmental reports to stakeholders and the public (Herzig and Schaltegger, 2006). There are also various national standards and regulations, as well as international reporting guidelines, such as the Global Reporting Initiative (GRI), that offer external certification of companies' environmental reports. Fifka (2012) reviews the development of social and environmental reporting from 1970 to 2011. Heconcludes that most environmental reporting research has used content analysis (79 percent), with, more lately, a shift to questionaires and interviews. This change of methodology, especially in north-western Europe and Australia, indicates that researchers are more keen on finding out the motivation for and perceptions of environmental disclosures. Fifka (2012) also calls for research on developing countries which have had very limited exposure to environmental reporting.

In Malaysia, the number of companies that voluntarily engage in some form of environmental reporting is increasing even though environmental considerations are regarded as new (Zulkifli, 2010). The majority of the engagement is by way of disclosures, in response to pressures to enhance and maintain the reputation of companies and to enhance shareholder

value and stakeholder awareness (Zulkifli, 2010). Environmental disclosure in Malaysia has been mandated by Bursa Malaysia (Malaysia's central stock exchange) for publicly listed companies since 2006. Bursa Malaysia is committed to encouraging listed companies to publish environmental reports as a step towards embracing sustainability. Nonetheless, not many companies go further than disclosing their CSR information in a section of their annual reports, which is the minimum requirement by Bursa Malaysia.

Further research on Malaysia's CSR reporting, environmental reporting and sustainability reporting over the years has explored what drives companies to report. For example, one study indicates that environmental reporting practices are lagging and that the extent of disclosure depends largely on the size and origin of the companies (Teoh & Thong, 1984). In a competition on the quality and comprehensiveness of disclosures in CSR reporting, StarBiz-ICRM reveal that there have been many improvements in CSR performance and disclosures among large and middle-sized companies, with the companies taking part receiving higher scores than in previous years (Business and Environment, April 2010). In a more recent CSR reporting competition, ACCA Malaysia shares its view that the quality of Sustainability and CSR Reporting of Malaysian companies has improved (ACCA Malaysia, 2011).

3. MALAYSIA AND THE ENVIRONMENT

The following section covers a brief background on Malaysia, its economy and environmental conservation efforts introduced to ensure sustainability.

Malaysia is one of the largest producers of palm oil, rubber and timber in the world (BBC Monitoring, 2012). Since Malaysia's independence, the drive for economic fulfilment through producing palm oil, rubber and export of timber, as well as diversification into

industrialisation, may have led to a situation where the environment is neglected (Che Hashim, 2001). Malaysia, whose economic drive has concentrated on the agricultural sector, should be compelled to support 'sustainable' agricultural practices and provide strategies to instil environmentally sustainable agricultural practices.

International conventions on the environment were instrumental in altering Malaysia's outlook on environmental conservation and protection. One of the main issues dominating the change was addressing environmental impacts; both in agriculture and industrialisation. The Environmental Quality Act 1974 (EQA) is enforced by the Department of Environment, with the main role of "preventing, controlling and abating pollution" (Department of Environment; Md. Jahi, Aiyub, Arifin, & Awang, 2009). Although the Act demonstrated the Malaysian government's commitment, it was not necessarily reflected in business organisations. A concerted effort by all parties towards environmental conservation within economic development was imperative.

It was not until the 3rd Malaysia Plan[1] (1976-1980) that any emphasis on environmental conservation was considered in Malaysia's economic setup. The plan closely examines "the effects of development and the required policies and programmes for environmental management and protection as well as the enforcement of the required legislation" (Third Malaysia Plan, 1976, p. 218). Pollution control is enforced under the Environmental Quality Act 197, with short term measures of discharges and emissions, medium-term measures of incorporation of environmental components into development processes and long-term measures of both physical environment and quality of life aspects being included in their planning (Che Hashim, 2001).

[1] The *Malaysia Plan* is a 5-year Malaysian government initiative of national development and considered to be a British post-colonial legacy.

4. THEORETICAL PERSPECTIVE

This research examines the extent of EMA implementation in Malaysian companies, whether there are processes which consider environmental conservation as part of organisational operations, as well as whether key personnel perceive environmental conservation to be important. The theory used to explain the research findings is institutional theory.

Qian and Burritt (2008) argue that EMA and its development can be seen through an institutional theory lens based on 3 pillars: regulatory, normative and cognitive institutions. These three pillars are associated with regulatory pressures (coercive), social environmental movements, collective professional influence (normative); and imitation of the behaviours of other organizations (mimetic).

Since this research looked at EMA implementation and its drivers, there were possibilities that EMA was implemented due to institutional pressures. Apart from that, the research also examined external influences compelling these organisations to implement EMA.

5. RESEARCH METHOD

According to Denzin and Lincoln (2000), research tries to understand the unknown, in this case whether there is any implementation of EMA in the companies studied. This research is qualitative in nature and takes an interpretive approach of comparing and contrasting theories and experiences of the interviewees. In order to understand what is happening within each organization, information was gathered in interviews and also some documents were analysed.

a. Participants

The hardest part of the research was gaining access to relevant companies. Contacts had to be made via 'gatekeepers' because the Malaysian 'corporate culture' is to direct all external communication to the Corporate Communication Division/Department at the companies' headquarters, as details of staff are not public. An opportunistic approach was adopted initially to gain access, which later "snowballed"as more participants were able to be engaged for interviews through prior contacts. The main priority was to gain access to companies that are publicly listed and in environmentally-sensitive industries. Table 1 lists the sectors and number of companies in which interviews were obtained. All of the companies were considered to be in environmentally sensitive industries.

Table 1: Number of accessed companies based on sectors

Sector	Access available	Listed in GRI website
Trading /Services (TS)	2	1
Construction (CN)	2	2
Industrial Products (IP)	2	
Plantation (PL)	1	
	*7	

**Note: 5 out of the 7 companies are GLCs[2].*

Table 2 summarises the number of participants interviewed. Note that the company names are coded to maintain the anonymity of the participating companies. TS stands for companies that are in the trading and the services industries. The participants are involved in gas distribution (TS-1) and integrated logistics (TS-2). CN stands for companies in the

[2] *Government-linked companies (GLCs)* are companies that are of commercial value which are directly owned by the government. The government has control over major decisions as well as appointment of high level management positions and directors (Khazanah Nasional, 2012).

construction industries. IP is industrial products and in this case they consist of a gas producer (IP-1) and a cable manufacturer (IP-2). PL stands for plantations, and the participating company is involved in palm oil production.

Table 2: Number of participants per company interviewed

Company	Number of participants	Participants
TS-1	2	A, B
TS-2	6	A,B,C,D,E, F
CN-1	6	A,B,C,D,E, F
CN-2	2	A, B
IP-1	1	A
IP-2	2	A, B
PL-1	5	A,B,C,D,E
	24	

b. Data collection

The interview period was from July to October 2011. Each interview took from 40 minutes to an hour. The interviews were carried out at the participants' offices during office hours at their convenience. Each interview was recorded and notes were taken as well. A drawback of the limited time taken was that information gathered may not be sufficient to provide an in depth understanding of the companies' operations. However, follow up interviews were conducted by telephone to overcome these limitations.

The semi-structured questions were provided prior to the interview sessions via email correspondence (see Appendix A). Each participant was given time to go through the questions prior to the interviews to enable them to decide whether to participate. They were also briefed about the background of the research and its main objectives: to investigate the extent of EMA implementation in the companies involved and to ascertain any internal or external pressures causing them to consider EMA.

The perspectives developed by Frost and Wilmshurst (2000) were used to ascertain whether there were any elements of EMA implemented in each company.The five perspectives are:

1. Inclusion of environmental information in the present management accounting information system
2. Availability of formal accounting procedures when dealing with specific environmental issues
3. Cost-benefit analysis that also takes into consideration any environmental issues when dealing with viability of projects, course of actions.
4. Undertaking environmental impact audits culminating company's activities
5. Reporting environmental information to external stakeholders

Apart from the above five perspectives, I also looked for processes and procedures to enhance environmental conservation as suggested by (Bennett & James, 2000). Internal and external pressures to implement EMA were ascertained from participants' perceptions.

Interviews were conducted with key personnel in departments that are directly relevant to core activities that add value to a company's competitiveness (Porter, 1985); for example, in the plantation company, the operations department; in the gas distribution company, the marketing department. Support personnel to the core activities, such as human resources, were not interviewed.

Evidence was also sought to confirm whether EMA implementation enhances performance. Burritt et al. (2002) claim that companies may report environmental performance in either (or both) monetary and non-monetary forms. However, the extent to which I was able to personally witness these items was limited due to the confidentiality of internal documentation.

Apart from the interviews, secondary sources were also analysed, such as: newspaper articles, annual reports, environmental reports, newsletters, interview transcripts, stock exchange announcements and internal documentation such as policies, guidelines and requirements.

6. FINDINGS AND DISCUSSION

This section discusses and analyses the findings from the semi-structured interviews. The following subsections are presented in thematic form, namely: evidence of EMA implementation, environment versus costs and internal and external pressures for EMA implementation.

a. Evidence of EMA implementation

The evidence collected from interviewees indicated the existence of some of Frost and Wilmshurst's (2000) perspectives. They posit that a company is deemed to have implemented environmental-related management accounting when it takes account of environmental information in their management accounting system, runs cost-benefit analysis that take into consideration environmental issues when making decisions, has formal accounting procedures for dealing with specific environmental issues, conducts environmental audits, and discloses environmental information to stakeholders. Also, some companies exhibited processes that would help initiate conservation of the environment, as proposed by Bennett and James (2000). Table 3 illustrates the extent of environmental-related management accounting implementation by the companies interviewed.

Table 3: Extent of EMA implementation

	CHARACTERISTICS	COMPANIES						
		TS-1	TS-2	CN-1	CN-2	IP-1	IP-2	PL-1
Frost & Wilmshurst (2000)	1. Inclusion of environmental information in management accounting information system		√	√				√
	2. Availability of formal accounting procedures when dealing with specific environmental issues		√	√	√			√
	3. Cost-benefit analysis considering any environmental issues when dealing with viability of projects, course of actions.				√			√
	4. Undertaking environmental impact audits of company activities	√	√	√	√	√	√	√
	5. Reporting environmental information to external stakeholders	√	√	√	√	√	√	√
Bennett & James (2000)	Processes and procedures that enhance initiation of environmental conservation		√		√			√

From the interviews, it was found that only TS-2 (logistic company) embeds environmental information in their management accounting system, although the extent depends on the type of cargo being shipped, especially hazardous goods like chemicals. It was also found that energy and water consumption are monitored in order to control costs. Nonetheless, the reason for cost control was economically driven rather than driven by concern for environmental conservation. In one example given, the control of costs was motivated by an aspiration to reduce fuel consumption by using railway tracks to transport goods from port to port rather than using the local highway. This would avoid heavy traffic congestion, which could be interpreted as a desire to reduce emissions. However, the operation had to be aborted later. TS-2C (Branch Manager) mentioned:

> *We have tried using railway and for a time it was cheaper to use railway [rather] than haulage but later on the condition changed to the opposite because KTMB revised the railway fee.*

Thus, the more important motivation was cost rather than the environment.

For analysing cost and benefit of projects, most of the companies provide some kind of environmental assessment. The most common was the Environmental Impact Assessment (EIA) reports. This assessment is required by the Department of Environment and enforced for projects that may have potential impacts on the environment: approval is essential before the projects can be executed. However, some of the companies may not be subject to EIA requirements as they subcontract the projects to other companies. Also, there are similar projects that may not necessarily require EIA reports as they are not located in densely populated areas. For example, CN-2B (Project Manager) shares insights on his company's uptake of cost benefit analysis which only considers environmental issues for certain projects:

> *This is only applicable for projects in cities like Kuala Lumpur and Penang which are highly populated and high density. Also, the fact that consumers in these areas are more capable of purchasing high end properties. … City people are aware of environmental concerns and can relate more to ideas to conserve it. Thus, the company is willing to spend more to accommodate these aspirations.*

All the companies had very good waste management systems and management of *scheduled waste*[3]. However, this may be due to the fact that waste must be declared and is subject to stringent regulations by the DOE. Wastes are recycled, scrapped, sold to licensed buyers or incinerated by licensed vendors. Failing to comply with these regulations is punishable by law.

Another element enquired about in the interviews was whether the companies undertake environmental impact audits on their operations and activities. It was found that the companies undergo various internal and external audit assessments (see Table 4).

[3] *Scheduled wastes* are any wastes falling within the categories listed under the first schedule of the Malaysian Environmental Quality Regulation.

Table 4: Type of annual environmental impact / other audit assessments

Company	Internal Audit assessment	External Audit assessment
TS-1	Safety & security functions, sub-contractor audits	ISO14000, DOE
TS-2	Regular checks on operations	CLASS, DOE
CN-1	Regular checks on operations	ISO14000, CONQUAS, DOE
CN-2	Regular checks on operations	ISO14000, DOE
IP-1	Intelligent Peak, air & foot patrols, Hazard study	ISO14000, DOE
IP-2	Regular checks on operations	DOE
PL-1	Water quality& consumption, smoke emission, soil quality	DOE

Note: DOE assessments are for scheduled waste, emission measurements, water quality, etc.

Companies often claim that external certifications give them 'credibility'. Nonetheless, Adams (2004) counter-claims that being certified does not necessarily mean that a company is 'credible'. Often certification by external bodies indicates that various processes are documented, but not necessarily that they are carried out. The ISO14000 certification, for example, does not provide an indicator that a company is implementing environmentally sound processes. This research provided evidence of this. CN-2 has gained a high reputation from environment-related awards and certifications received. However, this research found that there are few environment-related management accounting activities. Also, environmental concerns and considerations in their property development practices do not cover all of their projects but are limited to cities where the awareness of environmental conservation is higher than in the rural areas.

Various researchers have used legitimacy theory to explain why companies want to be seen as responsible to survive (Guthrie and Parker, 1989), and will use these external validations to legitimise their activities, actions and decisions (Deegan and Gordon, 1996; Deegan and Rankin, 1996; Wilmshurst and Frost, 2000; Wilmshurst et al., 2010). The image a particular company is trying to portray may be just a façade to cover its actual operations; this is

claimed by Adams (2004) who posits that the information disclosed by companies does not represent their true level of accountability.

Over and above the environmental considerations and concerns (as shown in Table 3) that the companies were addressing within their operations, some of the companies had processes and procedures related to conservation, such as managing waste and controlling consumption of energy and water. Bennett and James (2000) suggest that considering environmental conservation may lead to EMA implementation.

b. Environment vs. costs

This subsection discusses issues in processes and procedures carried out by the companies, which although they seem to be 'environmentally sustainable' are in fact derived from the motivation to manage and control costs.

The first issue is control and monitoring of projects, in relation to environmental concerns. In terms of management of operations, it was found that sometimes, depending on the type of industry, operations may not be controlled and managed by the companies themselves. CN-1 and CN-2 for example, do not have total control over construction operations on projects that are subcontracted. Due to the magnitude of their business, in terms of both number of locations and the vastness of each project, most of their construction projects are contracted out. CN-1 and CN-2 only provide specifications and requirements for projects, leaving the subcontractors to handle the execution part. Thus, the management and control of water consumption, waste management, materials used, for example, are under the subcontractors' authority. CN-2, in sharing their experiences, explained that maintaining low costs are crucial in projects located in rural areas, where the purchasing power of the locals is lower than in

the cities and determines the selling prices. This may affect the way the subcontractors choose to do their job.

The second issue is the difference in demand for environmentally conducive solutions by customers. CN-2, for example, provides buildings that incorporate Green Building Index[4] (GBI) characteristics for their residential and commercial properties in the cities but not in the rural areas. The reason, according to an interviewee at CN-2, was the higher cost of materials and processes involved; in the cities public concern for the environment and acceptance of the extra costs will be taken into consideration. Interestingly however, a Project Supervisor at CN-1 mentioned that the materials with '*green label*'[5] (GL) status are similar in price to the non-GL materials because most of the materials available in the market are GL certified. He added that even though it is the prerogative of suppliers to get their materials certified, the certification does add weight to the credibility of the supplier.

The third issue is process re-engineering. Sometimes, companies are finding procedures that, apart from reducing the production cycle, are also able to reduce impacts of operations on the environment. PL-1, through its active collaboration with the Malaysian Palm Oil Council, have developed a machine used in the mills that is not only able to reduce production of effluents but also has the ability to separate water from methane in the effluent; both the water and the methane can be used to run the turbine that generates power for the mill. In another example, IP-2 has changed from the use of LPG to natural gas in its processes in

[4] *The Green Building Index* is an environmental rating system for buildings. 'It is Malaysia's first comprehensive rating system for evaluating the environmental design and performance of Malaysian buildings based on the six (6) main criteria of energy efficiency, indoor environment quality, sustainable site planning & management, materials & resources, water efficiency, and innovation' (Pertubuhan Akitek Malaysia & Association of Consulting Engineers Malaysia, September 2011).

[5] *Green Label* products are ones that is earth friendly and harmless as well to human health and well-being.

order to have cleaner production. As mentioned by a technical manager, the substitution to cleaner production has led to a cheaper production cost and the use of less energy in their recyclable combustion system.

The fourth issue relates to biological processes and control. For example, PL-1 employs some biological means in running their plantations: composting during the replanting process, which enables rejuvenation of plantation soil without having to resort to open burning while at the same time reduces the use of fertilisers. PL-1 also make full use of all the by-products from their palm oil mills: the husks from palm fruit are used as burning materials and tree trunks are chipped into small pieces and left to compost on plantation land. The use of bullock carts to transport palm oil fruit bunches from plantation blocks to the main road reduces the use of diesel. They also use biological control, such as barn owls and snakes to control rodents, thus reducing dependency on pesticides.

A final issue of concern in this research is the decommissioning procedures at some of the companies. TS-1 for example, has a decommissioning structure where gas supply will be disconnected by end-capping both ends of the pipes used in transporting the gases. These pipes will be left underground indefinitely when a contract to supply gas to customer ceases. An engineer said that the company has not commissioned any research into looking at the environmental effects of leaving the steel pipes in the earth for an unspecified time.

Where procedures and processes are concerned, the companies strictly follow regulations set by regulators such as the DOE. However, some of the companies go beyond mere compliance, showing commitment towards conserving the environment and at the same time reducing the operational costs. This is especially true for PL-1, which is in a very controversial industry, palm oil production. Prior to the 1980s the industry faced accusations of causing environmental degradation from water and soil contamination as well as soil

erosion. Nonetheless, the industry has positively developed its know-how and processes to ensure that the old ways have ceased being practiced. Open burning, which was being practiced in the 1970s, has been discontinued; usage of pesticides is being controlled; effluents from palm oil processes are being treated and pH-tested before being released into waterways.

c. Internal and external pressures for EMA implementation

Although there are elements of waste management, and control of water, energy and fuel consumption, as well as instances where these are being monitored and recorded, there were no pressures for EMA to be developed and used as a strategic tool in the companies. The interviewees felt that the major pressure was to comply with laws and regulations. Aside from the threat of punishment, other motivations for companies to be environmentally concerned found in prior research include: legitimacy of the regulation being imposed on them (Tyler, 2006), the impact of regular inspection and enforcement activities (Gunningham, Thornton, & Kagan, 2004) as well as the socially imposed cost of embarrassment, shame or guilt (Grasmick & Bursik Jr., 1990). Also, reputation, corporate image and branding are considered as important for corporate players because these will solidify their existence within their industry.

The research found that some of the companies have pressures from customers to adhere to environmentally conducive operations. For example, most of IP-2's customers insist on the company's having various certifications, which on close scrutiny have environmental and safety implications in regard to the processes and materials used. On further query, it was established that foreign customers especially from the EU, Australia and New Zealand had very stringent requirements in this regard.

Another issue is the clash of authority between the DOE and state governments. Although the DOE has a say in approval of projects, state governments have the authority to approve projects within their boundaries. The situation may impact on the execution of environmental control by the DOE if the state government is receptive to projects merely because they are of economic value. The location of certain projects may determine the level of environmental inspection and monitoring being implemented. One example derived from an interview is that the level of commitment from the DOE in terms of monitoring companies' operations are subject to their locations: the further away and more remote the location, the less likely is it for the operations to be monitored, especially in remote parts of Sabah where there is a lack of infrastructure such as roads. Thus, the extent of environmental consideration and conservation may be at risk if the DOE and the state government do not possess similar principles concerning the environment.

7. CONCLUSION

In summary, although there is an awareness of the importance of environmental conservation among these environmentally sensitive companies, and although in some cases they are using environmentally considerate operations in some cases, financial implications are always the major focus. Companies are willing to implement EMA related tools as long as the consequences for them are financially beneficial. Apart from that, pressure and expectations from stakeholders, such as customers, were seen to be the reason for capital investment and other environmental actions.

If Malaysia is serious in its push towards sustainability, there must be concerted efforts by the central and state governments, the companies and other stakeholders to establish the success of environmental conservation hand in hand with economic wellbeing. The government has to play its part in providing assistance and clear regulations to companies to adhere to. The

customers should not trade off their environmental requirements in order to obtain cheaper materials or goods from companies and they should insist on environmentally safe processes and products. Financial institutions should also ensure that they only approve environmentally viable projects and capital investments. And the general public should also be aware and take command of their rights for a sustainable wellbeing.

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APPENDIX A

Guide for semi-structured interview.

The interview is segmented into: Policy and Management issues.

The first part will cover existing environmental policy in the organisation. The second part will encompass management topics such as: planning, operation, remedial action, management review and reporting.

The discussion will be conducted primarily in English, although concessions will be made if the interviewee feels more comfortable to share views in Bahasa Malaysia. With consent, this general discussion will be recorded. The objective of the discussion is to learn from the interviewees about the organisation's practices. The idea is to encourage interviewees to open up and allow them to express themselves on their own terms and at their own pace. In this regard, a substantial number of the interview questions will depend on the respondents' responses.

The following semi-structured (open-ended) questions will be used as a guide.

I. POLICY

1. What commitments has your organisation made in regard to caring for the environment? How does your organisation monitor its commitments to looking after the environment? [Interviewer: follow-up questions if the following issues are not mentioned: What policies do you have to support environmental management? What practices? Systems? What management information is collected? By whom? And who uses it?]

II. MANAGEMENT ISSUES

Planning:

2. How do you make sure that environmental considerations are taken care of when you make managerial decisions?

3. Are there any environmental compliance requirements, health or safety regulations that you have to abide by at either the national or state level? How do you go about ensuring that your organisation's activities, products or services are in line with these requirements and regulations?

4. How do you ensure your departmental objectives and targets reflect the organisation's concerns at preserving the environment?

Operations:

5. are your views on environmental protection and sustainable development? How are these considerations being reflected in your the roles, responsibilities and authority? To what extent is the principles of environmental protection and sustainable development being incorporated in your decision making process?

6. To what extent are you empowered to take the initiative, submit suggestions for improvement, and to suggest actions or policies to reduce your organisation's environmental impacts. How much is this being carried out here?

7. How do you ensure that your departmental operations and activities are carried out under controlled conditions and in accordance with operating criteria to ensure compliance with environmental policy and the achievement of objectives and targets?

8. Do you manage your own monitoring and conservation of energy, water, waste avoidance, or other environmental issues? Is the information documented? Who else sees this information? How do you/ how does your department use this information? Who else in the organisation uses this information? How? When? What for? What kind of information do you make available to the organization for environmental/ sustainability reporting purposes?

9. How does your department track chemical use (if applicable)? How is the information documented? How much of the information do you use to make departmental decisions? Who else sees it? What kind of information do you make available to the organization for environmental/ sustainability reporting purposes? (Do you require other department's environmental data as well in making decisions?) What environmental data from other departments do you use? How? What for?

10. If your department is faced with issues of habitat protection and stewardship (such as watershed management, wilderness protection, biodiversity, etc.) in areas that may be affected by your operations, how would you deal with it?

11. In terms of hazardous waste (if applicable):
    a. How frequent do you monitor and document usage, volumes and disposal of any hazardous waste generated? What do you do with the information?
    b. How do you dispose of the hazardous waste?

12. How do you decide who becomes your (sub)contractors, suppliers, service providers and consultants? Do you consider their environmental records/ reputation? Why/ why not? How? How far would you try to ensure that they are genuinely environmentally conscious as you?

13. In terms of products, services and operations:
    a. Can you share any instances where you were considering a lucrative endeavor but had to also consider environmental issues? Can you explain on that?
    b. What would you do if you've misjudged a particular project and find that you are directly affecting the community?

14. How does your organisation communicate, encourage participation and get stakeholders' understanding of your organisation's environmental decision making? Do you perceive Malaysian stakeholders are interested and concern about how you manage the environment with making decisions? Why do you think they are that way?

Remedial Action:

15. With regards to monitoring and measuring whether your operations and activities affect the environment:
    a. How frequent do you go through the cycle?
    b. Why do you periodically monitor and measure?
    c. How are the measures used?
    d. Who are the users?

16. What systems, practices or information does your department use to measure the cost and quality of environmental protection services and the use of resources entrusted to the organisation?
    a. How is this used within your department?
    b. Is this done through a managerial cost accounting system or other financial management system that routinely compiles, analyses, and reports on environmental costs?
    c. Which environmental costs are so identified (e.g., management costs, waste disposal, training, auditing)?
        i. At what level are costs aggregated (e.g., product, process, facility, division, corporate)
        ii. What is the purpose of the compilation?

d. How often is this information compiled? Who gather it? How is it recorded? Who is it used by – outside the department/ outside the company?

17. How do you plan for what to do in instances where there are significant environmental mishaps:
    a. Do you document emergency/contingency plans exist for rectifying significant environmental mishaps?
    b. Who is responsible? Who has authority?

Management Review & Reporting:

18. Earlier you mention that your department conducts monitoring, document and reassess your environmental considerations use the information in your decision making (if applicable).
    a. Does the Executive Committee or Board regularly receive these key information, such as performance information, major initiatives or investigations of issues affecting the environment?
    b. What happens to these information after the BOD have reviewed them?

19. Is accountability for environmental protection and sustainable development performance, environmental compliance and operational decision making principally handled in a centralized, mixed or decentralized fashion? Do you agree with the practice so far?

20. Malaysia does not have a specific government department that oversees whether environmental regulations/ guidelines that business are keeping to. However, we do have agencies that look after some aspects of environmental monitoring and enforcement like the Department of Environment. Which regulators do your organisation reports to?

21. Does your organisation produce an annual Environment Report and is it externally verified or validated? Why do you prepare these annual reports?

Disclaimer: Not all interview questions will be asked in a consistent, systematic order and sometimes additional questions and discussion topics will be covered during the interview due to its semi-structured and open nature.